| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/541,141 | 03/31/2000 | Wenjun Zeng | TAL7146.68 | 3007 |

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| EXAMINER |
|---|
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| ART UNIT | PAPER NUMBER |
|---|---|
| 2613 | 4 |

DATE MAILED: 02/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | Application No. | Applicant(s) |
|---|---|---|
| **Office Action Summary** | 09/541,141 | ZENG, WENJUN |
| | Examiner | Art Unit |
| | Shawn S An | 2613 |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**.     2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) _1-27_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) _9-19_ is/are allowed.

6)☒ Claim(s) _1-6,8,20-25 and 27_ is/are rejected.

7)☒ Claim(s) _7 and 26_ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some *  c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _2,3_.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

# DETAILED ACTION

## *Claim Rejections - 35 USC § 102*

1.    The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2.    Claims 1-2, 4, and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee (6,226,050 B1).

**Regarding claim 1**, Lee discloses a method of processing a decompressed image comprising the steps of:

establishing a filtering axis aligned parallel to an image edge in a block of image pixels (Fig. 2);

selectively filtering a plurality of pixels arrayed substantially parallel to the filtering axis (col. 3, lines 27-56).

**Regarding claim 2**, Lee discloses identifying a first and a second pixel  located on a projection parallel to a candidate axis, the first/second pixels located in a vicinity of a first/second boundary of the block (Fig. 2, C, D);

comparing the first and second pixels, and repeating above steps for candidate axis, and designating the filtering axis having a predefined relationship to corresponding comparisons for other candidate axes (col. 3, lines 27-56).

**Regarding claims 4 and 8**, Lee discloses designating pixels to be subject to filtering if a comparison of pixels adjacent to a boundary of the block satisfies a predetermined relationship, identifying at least one pixel on each side of the boundary as a filtering range by comparing pairs of pixels further removed from the boundary to a threshold, and selectively filtering the pixels of the filtering range (col. 1, lines 58-61; col. 3, lines 27-38).

## *Claim Rejections - 35 USC § 103*

3.     The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4.     Claims 3, 5-6, 20-25, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (6,226,050 B1).

**Regarding claim 20**, Lee discloses all of the claimed limitation except filtering first and the second <u>interlaced fields</u>.

However, the Examiner takes official notice that interlaced fields or progressive fields are well known formats as in MPEG 2 in the art.

Therefore, it would have been considered quite obvious to a person of ordinary skill in the relevant art employing the Lee's reference to incorporate the well known interlaced fields so as to selectively filter the block of the interlaced fields parallel to the filtering axis in order to reduce blockiness or artifacts.

**Regarding claims 3 and 22**, the Examiner takes official notice that computing mean of a difference is well known in the art. Therefore, it would have been considered quite obvious to compute the minimum of a mean of a difference between the first and the second pixels. Note: see Kim (6,594,400).

**Regarding claims 5-6 and 24-25**, Lee discloses comparing the absolute value of the calculated gradient with a threshold (col. 1, lines 44-50). Therefore, it is considered a design choice to compare difference of pixels with the upper and/or lower boundary threshold just as the comparing purpose are the same.

**Regarding claim 21**, Lee discloses identifying a first and a second pixel located on a projection parallel to a candidate axis, the first/second pixels located in a vicinity of a first/second boundary of the block (Fig. 2, C, D);

comparing the first and second pixels, and repeating above steps for candidate axis, and designating the filtering axis having a predefined relationship to corresponding comparisons for other candidate axes (col. 3, lines 27-56).

**Regarding claims 23 and 27**, Lee discloses designating pixels to be subject to filtering if a comparison of pixels adjacent to a boundary of the block satisfies a predetermined relationship, identifying at least one pixel on each side of the boundary as a filtering range by comparing pairs of pixels further removed from the boundary to a threshold, and selectively filtering the pixels of the filtering range (col. 1, lines 58-61; col. 3, lines 27-38).

*Allowable Subject Matter*

5.      Claims 7 and 26 are objected to as being dependent upon a rejected base claims 1 and 20, respectively, but would be allowable: if claim 7 is rewritten in independent form including all of the limitations of the base claim 1 and any intervening claims; and if claim 26 is rewritten in independent form including all of the limitations of the base claim 20 and any intervening claims.

Dependent claims 7 and 26 recite the novel feature comprising the step, wherein the lower threshold comprises a function of a quantization parameter applicable to the block.

Accordingly, if the amendments are made to the claims listed above, and if rejected claims are canceled, the application would be placed in condition for allowance.

6.      Claims 9-19 are allowed.

7.      Claims 9-19 recite the novel features/steps of post processing a decompressed image.

The art of record fails to anticipate or make obvious the novel features as specified in these claims.

## *Conclusion*

8.      The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

A)  Kim (6,594,400 B1), Method of removing block phenomenon and ring phenomenon in compression coded image.

B)  EP (1,146,748 A2), a method of directional filtering for post processing the compressed video.

C)  Vehvilainen (6,504,873 B1), Filtering based on activities inside the video blocks and at their boundary.

D)  Astle (5,590,064), Post-filtering for decoded video signals.

E)  Kim (5,475,434), Blocking effect attenuation apparatus for high definition TV receiver.

F)  Yuan (Method and apparatus for processing block coded image data to reduce boundary artifacts between adjacent image blocks.

G) Fukuda (5,625,714), Image signal decoding device capable of removing block
distortion with simple structure.

9. Any inquiry of a general nature or relating to the status of this application should be
directed to the Group receptionist whose telephone number is (703) 305-4700.

10. Any inquiry concerning this communication or earlier communications from the
examiner should be directed to Shawn An whose telephone number (703) 305-0099 and
schedule are Tuesday-Friday.

SSA

Primary Patent Examiner

February 3, 2004